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Tretoheliocephala cylindrospora sp. nov., an asexual fungus from Thailand

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Abstract—*Tretoheliocephala cylindrospora* is described and illustrated as a new species collected from a decaying twig of an unidentified plant in Phu Laenkha National Park, Chaiyaphum Province, northeastern Thailand. The new fungus, which is compared with *T. compacta*, the type species of the previously monotypic genus, is characterized by unbranched conidiophores that produce solitary, oblong or cylindrical, unicellular conidia.

Key words—microfungi, morphology, plant debris, taxonomy

Introduction

Recent work on fungal biodiversity in Thailand has prompted an increase in the mycobiota of the country with several new species (e.g., Boonyuen & al. 2016; Chuaseeharonnachai & al. 2013, 2014, 2016, 2017; Sri-indrasutdhi & al. 2010, 2015; Yamaguchi & al. 2012). During continuing surveys of microfungi associated with plant materials in Thailand, a *Periconia*-like fungus was collected on an unidentified decaying twig. The conidiogenesis and conidial morphology placed this fungus in the genus *Tretoheliocephala* Gusmão & al., but it demonstrated clear differences from the single *Tretoheliocephala* species previously described (Gusmão et & al. 2017) and is therefore proposed as new to science.

Materials & methods

Samples of decaying leaves and twigs were collected in October 2013 from Phu Laenkha viewpoint (16°01′N 101°53′E) in Phu Laenkha National Park, Chaiyaphum Province, Thailand. Samples were transported to the laboratory and washed with tap water to remove soil particles and adhering debris. The samples were soaked with sterile distilled water and incubated in moist chambers at room temperature (~20–25°C) for at least 2 weeks. The fungus was isolated under an Olympus SZ61 stereomicroscope using the single spore technique outlined by Goh (1999). Spores were transferred to different media—cornmeal agar (CMA), malt extract agar (MEA), potato carrot agar (PCA), potato dextrose agar (PDA), and water agar (WA) with added 50 µg/mL of two antibiotics (penicillin and streptomycin)—as recommended by Choi & al. (1999) and Kirk & al. (2008), but isolation was unsuccessful.

Fresh material was mounted in water and examined and measured using an Olympus CX31 compound microscope equipped with a drawing tube. Microphotographs were obtained with an Olympus DP70 equipped with Nomarski differential interference optics. Permanent slides are deposited at the BIOTEC Bangkok Herbarium, Thailand (BBH).

Taxonomy

Tretoheliocephala cylindrospora Chuaseehar., Somrith. & Boonyuen, **sp. nov.**

MB 828099 PLATES 1, 2

Differs from T. compacta (type of the monotypic genus) by its solitary, oblong or cylindrical, unicellular conidia on unbranched conidiophores.

TYPE: Thailand, Chaiyaphum Province, Phu Laenkha viewpoint in Phu Laenkha National Park, 16°01′N 101°53′E, on dead twig of an unidentified plant, 31 Oct. 2013, C. Chuaseeharonnachai (**Holotype**, BBH 38817).

ETYMOLOGY: The specific epithet refers to the cylindrical shape of the conidia.

Saprobic on dead twig. Asexual morph: COLONIES on natural substratum effuse, brown or black, hairy. MYCELIUM mostly immersed in the substratum, hyphae branched, septate, smooth-walled, pale brown to brown, 1.25–2.5 µm diam. CONIDIOPHORES macronematous, mononematous, unbranched, capitate at the apex (rarely spathulate), cylindrical below, erect, sometimes regenerating at the terminal end with one enteroblastic percurrent extension, 6–10-septate, smooth-walled, brown to dark brown toward the base, 100–227 µm long, 3.75–5 µm diam. at the apex, 7.5–10 diam. at the base (x = 180.16 ×

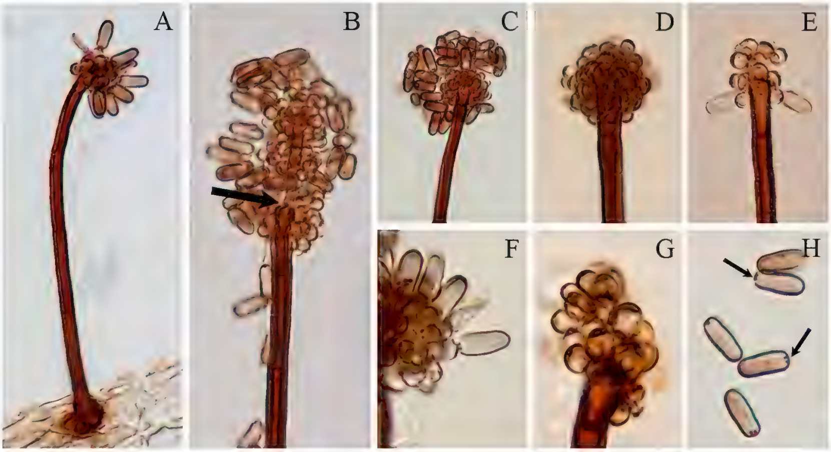

Plate 1. *Tretoheliocephala cylindrospora* (holotype, BBH 38817). A–E. Conidiophores with conidiogenous cells and conidia (the arrow in B indicates regeneration point of the conidiophores); F, G. Conidiogenous cells and conidia. H. Conidia (arrows indicate pore-like detachment scars at the basal end). Scale bars: A, B = 15 µm; C–E = 10 µm; F–H = 5 µm.

4.87 × 8.75 µm; n = 25). Conidiogenous cells monotretic, discrete, globose, determinate, terminal, brown to dark brown, smooth-walled, aggregating within a compact system of globose to subglobose cells (2.5–5 µm diam) to form a capitulum with a diameter of 12.5–32.5 µm. Conidial secession schizolytic. Conidia solitary, oblong or cylindrical with rounded apices, unicellular, dry, brown, smooth-walled with a minute pore-like detachment scar at the basal end, 7.5 × 3 µm (n = 50).

Sexual Morph: Unknown.

Comment—*Tretoheliocephala* was erected by Gusmão & al. (2017), typified by its only species, *T. compacta*. The genus was characterized by macronematous, erect dark brown conidiophores with a compact cluster of globose, monotretic conidiogenous cells that produce solitary or blastocatenate, ovoid, oblong, dolabriform, sub-obpyriform, or obcuneiform, 0–2-septate, brown conidia.

Our new species has features that fit well within the generic description of *Tretoheliocephala*, forming stalked conidiophores with a more or less spherical compact terminal cluster of globose and monotretic conidiogenous cells producing oblong or cylindrical conidia.

Morphologically, *T. cylindrospora* is distinguished from *T. compacta*, which has larger, unbranched conidiophores (320–700 × 15–19 µm) or occasionally

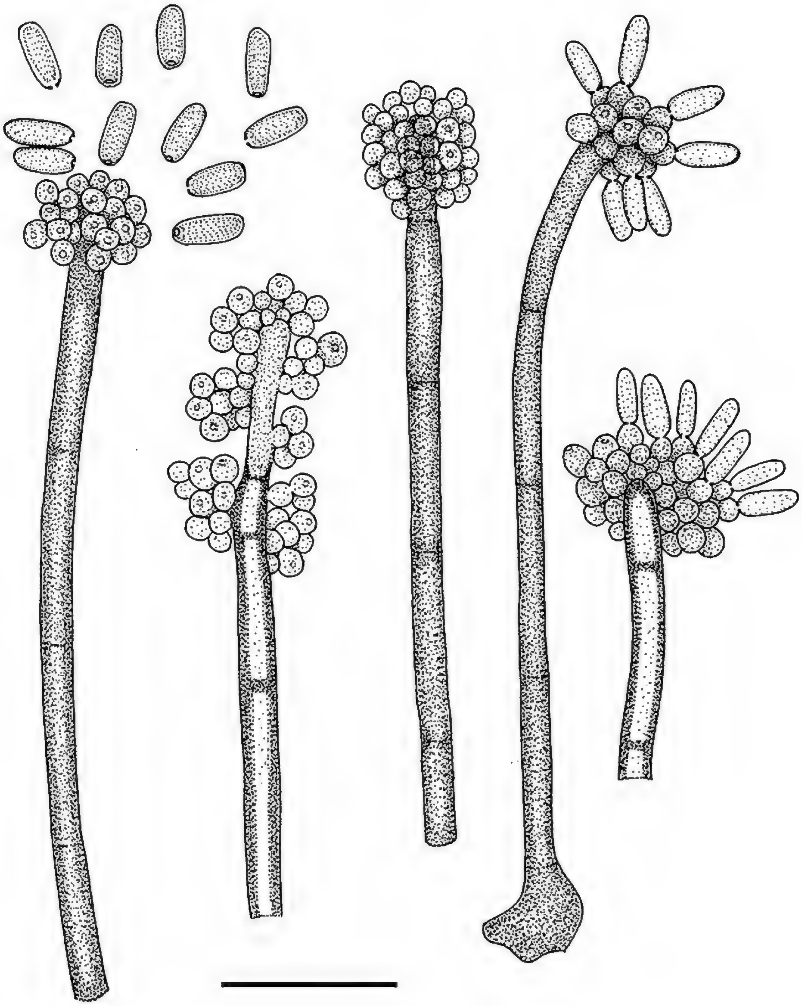

Plate 2. *Tretoheliocephala cylindrospora* (holotype, BBH 38817). Conidiophores, conidiogenous cells, and conidia. Scale bar = 20 µm.

branched conidiophores (200–300 × 13–15 µm), larger conidiogenous cells (8–12 µm diam), and larger morphologically variable, 0–2-septate (mostly 1-septate) conidia (12–21 × 6–7 µm) ranging from ovoid, oblong, dolabriform, subobpyriform to obcuneiform, formed solitarily or blastocatenately (Gusmão & al. 2017).

We regard *T. cylindrospora* as a rare species, in view of the fact that it has been found only once since 2010 during our study of microfungi of Thailand.

Despite several attempts to isolate this fungus onto synthetic media, the new fungus failed to grow on CMA, MEA, PCA, PDA and WA, suggesting that the nutritional requirements in these media may not be enough for germination and viability of the fungus. Thus, we were unable to undertake sequencing of this fungus. Further collections are required to enable culture and sequencing of *Tretoheliocephala* species to determine their taxonomic placement in the *Ascomycota.*

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